

NASA TECH BRIEF



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Hydrogen-Oxygen Powered Internal Combustion Engine

Because of a need for an intermediate-level power source, a program was initiated to convert the combustion of hydrogen and oxygen to useful power in an internal combustion engine. As a result, a five-hp single-cylinder internal combustion engine was built. Operating on gaseous hydrogen and oxygen, the engine was tested at 4000 rpm for longer than 100 hours. In appearance, the engine closely resembles a conventional two-stroke cycle, internal combustion engine.

In operation, the hydrogen and oxygen, under high pressure, are injected sequentially into the combustion chamber. First hydrogen at 300 psi, then oxygen at 800 psi, is injected to form a hydrogen-rich mixture. This specific mode of injection eliminates previous difficulties of preignition, detonation, etc., encountered with carbureted, spark-ignited, hydrogen-air mixtures. Ignition at startup is by means of a palladium catalyst, and after warmup is by autoignition. The best measured brake specific fuel consumption (hydrogen and oxygen) attained to date is 1.6 lb/hp-hr. Based on the results of these tests, prototype development is considered completed.

This innovation should be useful in areas where poisonous exhaust gases pose a severe problem.

Notes:

1. The following documentation may be obtained from:

Clearinghouse for Federal Scientific
and Technical Information
Springfield, Virginia 22151
Single document price \$3.00
(or microfiche \$0.65)

Reference:

NASA-CR-255 (N65-28954), Development of
a Hydrogen-Oxygen Internal Combustion
Engine Space Power System

2. Requests for further information may be directed to:

Technology Utilization Officer
Lewis Research Center
21000 Brookpark Road
Cleveland, Ohio 44135
Reference: TSP70-10610

Patent status:

No patent action is contemplated by NASA.

Source: N. Morgan and H. Cameron of
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